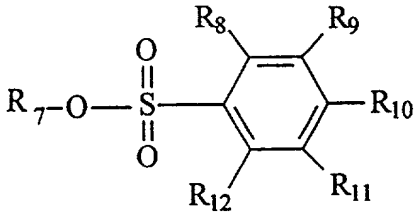
What is claimed is:

1. A thermally curable polymer composition comprising a hydroxyl-containing polymer, an amino cross-linking agent and a thermal acid generator, wherein said hydroxyl-containing polymer comprises monomer units selected from the group consisting of: cyclohexanol, hydroxystyrene, hydroxyalkyl acrylate or methacrylate, hydroxycycloalkyl acrylate or methacrylate, hydroxyalkylcycloalkyl acrylate or methacrylate, arylalkyl alcohol, and allyl alcohol.

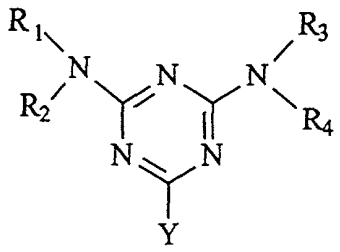
2. The composition of claim 1 wherein said hydroxyl-containing polymer comprises monomer units of cyclohexanol, hydroxystyrene, hydroxyalkyl acrylate or methacrylate, biphenyl acrylate or methacrylate and hydroxycycloalkyl acrylate or methacrylate and has a number average molecular weight between about 14,000 to 30,000.

3. The composition of claim 1 wherein said thermal acid generator has the general structure:



where R_7 is a substituted or unsubstituted alkyl, cycloalkyl or aromatic group wherein the substituted group is halogen, alkoxy, aromatic, nitro or amino group; and R_8 to R_{12} are independently selected from hydrogen, linear or branched C_1 to C_4 alkyl, alkoxy, amino, alkylamino, aryl, alkenyl, halogen, acyloxy, cycloalkyl, or annulated cycloalkyl, aromatic or heterocyclic.

4. The composition of claim 1 wherein said amino cross-linking agent has the general formula:



wherein Y is NR_5R_6, or a substituted or unsubstituted aryl or alkyl group, R_1 to R_6 are independently a hydrogen or a group of the formula $-CH_2OH$ or CH_2OR_{17} where R_{17} is a alkyl group of about 1 to 8 carbons.

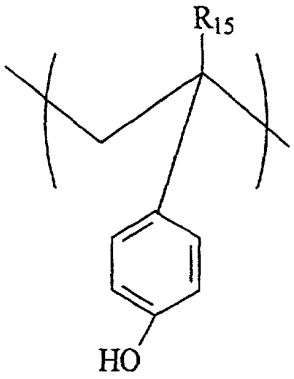
5. The composition of claim 1 wherein said hydroxyl containing polymer comprises a monomer unit of allyl alcohol and has a polymer weight average molecular weight of 2000 to 20000.

6. The composition of claim 1 further comprising a monomer unit of a cycloaliphatic ester of acrylic or methacrylic acid.

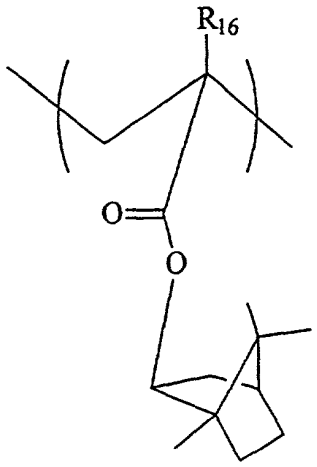
7. The composition of claim 6 wherein said monomer unit of cycloaliphatic ester of acrylic or methacrylic acid is selected from the group consisting of cyclohexyl acrylate, cyclohexyl methacrylates, 4-tert-butylcyclohexyl acrylate, 4-tert-butylcyclohexyl methacrylate, isobornyl acrylate, isobornyl methacrylate adamantyl acrylates and methacrylates, dicyclopentenyl acrylates and methacrylates, 2-(dicylcopenteneyloxy)ethyl acrylates and methacrylates.

8. The composition of claim 1 wherein said hydroxyalkyl acrylate or methacrylate is selected from the group consisting of: hydroxymethyl acrylate or methacrylate, 2-hydroxyethyl acrylate or methacrylate, 3-hydroxypropyl acrylate or methacrylate, 4- hydroxybutyl acrylate or methacrylate, 5-hydroxypentyl acrylate or methacrylate and 6- hydroxyhexyl acrylate or methacrylate.

9. The composition of claim 1 wherein said hydroxyl-containing polymer comprises the following monomer units:



(A)

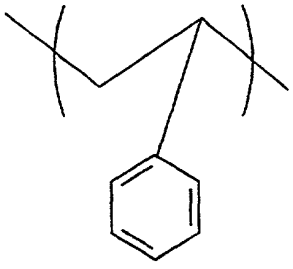


(B)

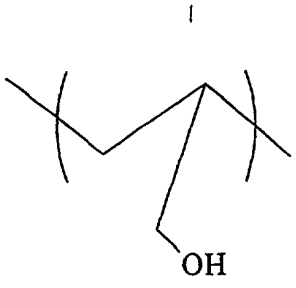
wherein R_{15} and R_{16} are independently a hydrogen or a methyl.

10. The composition of claim 9 wherein the mole % of monomer unit (A) is about 25 to 60 mole % and the mole % of monomer unit (B) is about 40 to 75 mole %.

11. The composition of claim 1 wherein said hydroxyl-containing polymer comprises the following monomer units:



(C)



(D)

12. The composition of claim 12 wherein the mole % of monomer unit (C) is about 39-60 mole % and the mole % of monomer unit (D) is about 40 to 61 mole %.

13. The composition of claim 3 wherein said thermal acid generator is selected from the group consisting of: cyclohexyl p-toluenesulfonate, menthyl p-toluenesulfonate, bornyl p-toluenesulfonate, cyclohexyl triisopropylbenzenesulfonate, cyclohexyl 4-methoxybenzenesulfonate.

14. A photolithographic sensitive coated substrate comprising:

(a) a substrate;

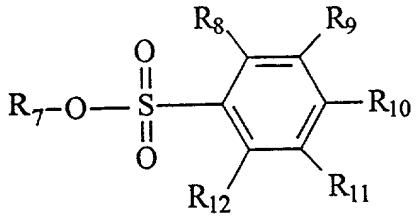
(b) a thermally cured undercoat on the substrate; and

(c) a radiation-sensitive resist topcoat on the thermally cured undercoat;

wherein said thermally cured undercoat comprises a thermally cured composition comprising a hydroxyl-containing polymer, an amino cross-linking agent and a thermal acid generator.

15 The coated substrate of claim 14 wherein said hydroxyl-containing polymer comprises monomer units selected from the group consisting of: cyclohexanol, hydroxystyrene, hydroxyalkyl acrylate or methacrylate, hydroxycycloalkyl acrylate or methacrylate, aryalkyl alcohols, and allyl alcohol monomer units.

16. The coated substrate of claim 14 wherein said thermal acid generator has the general structure:



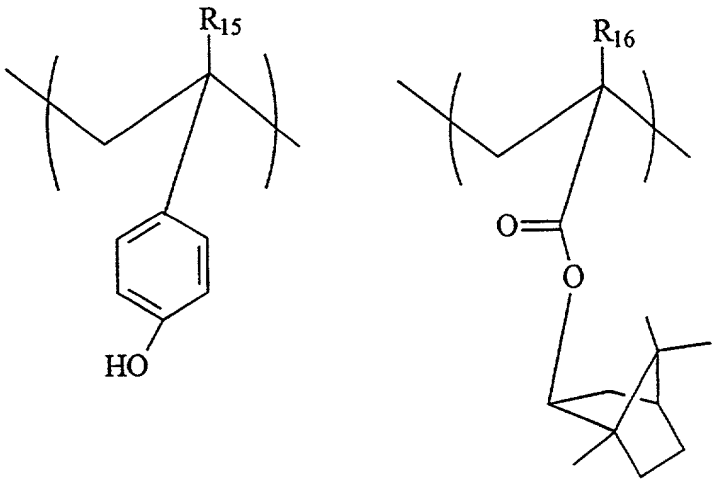
where R_7 is a substituted or unsubstituted alkyl, cycloalkyl or aromatic group wherein the substituted group is halogen, alkoxy, aromatic, nitro or amino group; and R_8 to R_{12} are

independently selected from hydrogen, linear or branched C_1 to C_4 alkyl, alkoxy, amino, alkylamino, aryl, alkenyl, halogen, acyloxy, cycloalkyl, or annulated cycloalkyl, aromatic or heterocyclic.

17. The coated substrate of claim 15 wherein said hydroxyl-containing polymer comprises monomer units selected from the group consisting of: hydroxyalkyl acrylate or methacrylate and allyl alcohol units.

18 The coated substrate of claim 14 wherein said hydroxyl-containing polymer further comprises monomer units of cycloaliphatic ester of acrylic or methacrylic acid units.

19. The coated substrate of claim 14 wherein said hydroxyl-containing polymer comprises the following monomer units:

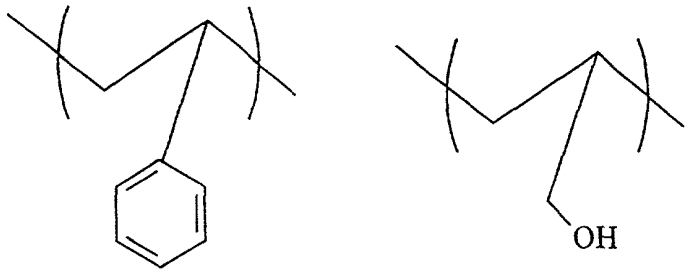


(A) (B)

wherein R_{15} and R_{16} are independently a hydrogen or a methyl.

20. The coated substrate of claim 19 wherein the mole % of monomer unit (A) is about 25 to 60 mole % and the mole % of monomer unit (B) is about 40 to 75 mole %.

21. The coated substrate of claim 14 wherein said hydroxyl-containing polymer comprises the following monomer units:



(C) (D)

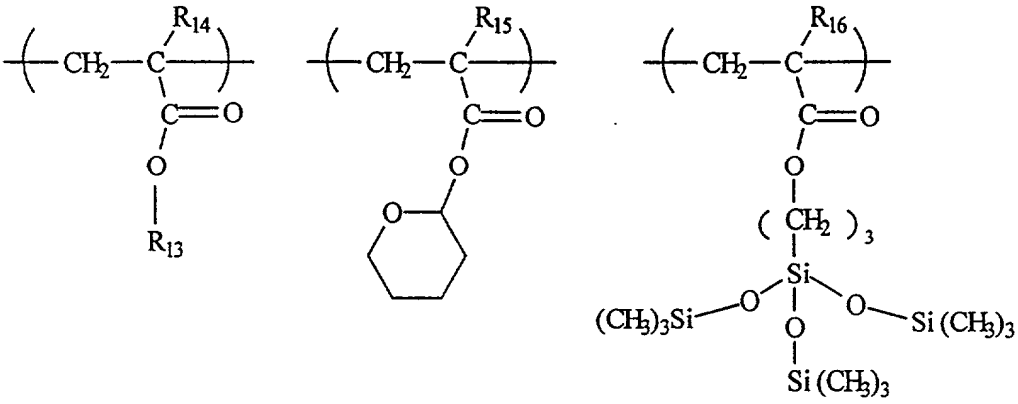
22. The coated substrate of claim 21 wherein the mole % of monomer unit (C) is about 39-60 mole % and the mole % of monomer unit (D) is about 40 to 61 mole %.

23. The coated substrate of claim 14 wherein said hydroxyl-containing polymer comprises biphenyl acrylate or methacrylate and hydroxyethyl acrylate or methacrylate.

24. The coated substrate of claim 23 wherein the amount of biphenyl acrylate or methacrylate is about 50 to 90 mole % and the amount of hydroxyethyl acrylate or methacrylate is about 10 to 50 mole %.

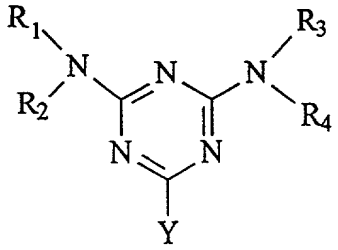
25. The coated substrate of claim 14 wherein the radiation-sensitive resist topcoat is a chemically amplified resist containing silicon.

26. The coated substrate of claim 23 wherein the wherein the radiation sensitive topcoat comprises a polymer comprising the following monomer units:



wherein R_{13} is methyl or hydroxyethyl, R_{14} is hydrogen, methyl or $CH_2CO_2CH_3$, and R_{15} and R_{16} are hydrogen or methyl, with each choice made independently.

27. The coated substrate of claim 14 wherein said amino cross-linking agent has the general formula



wherein Y is NR_5R_6, or a substituted or unsubstituted aryl or alkyl group, R_1 to R_6 are independently a hydrogen or a group of the formula $-CH_2OH$ or CH_2OR_{17} where R_{17} is a alkyl group of about 1 to 8 carbons.

28. A process for the production of relief structures comprising the steps of:
(a) forming a coated substrate; wherein said coated substrate comprises a substrate; a thermally cured undercoat disposed on said substrate; and a radiation-sensitive resist topcoat disposed on said thermally cured undercoat; and wherein said thermally cured

undercoat comprises a thermally cured composition comprising a hydroxyl-containing polymer, an amino cross-linking agent and a thermal acid generator;

(b) imagewise exposing said radiation-sensitive resist topcoat to actinic radiation; and

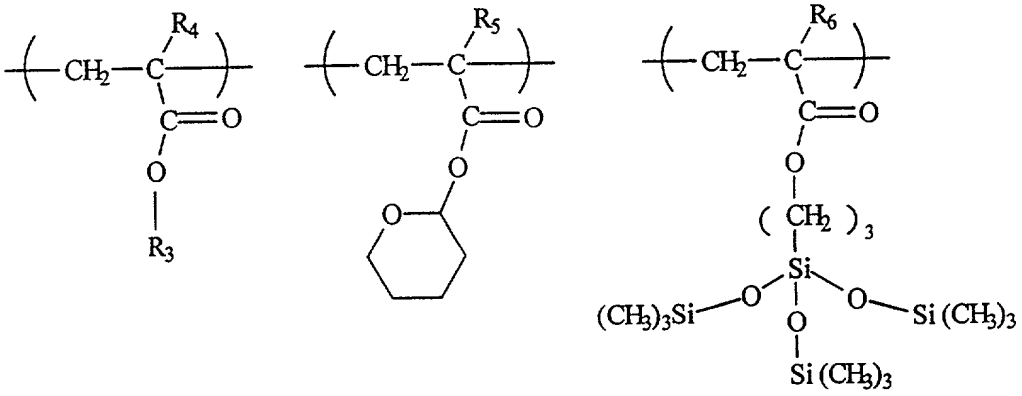
(c) forming a resist image by developing said radiation-sensitive resist topcoat with a developer.

29. The process of claim 26 wherein said hydroxyl-containing polymer comprises about 30 to 60 mole % of hydroxystyrene monomer units and 40 to 70 mole % of isobornyl acrylate or methacrylate monomer units.

30. The process of claim 26 wherein said hydroxyl-containing polymer comprises about 39 to 60 mole % of styrene monomer units and about 40 to 61 mole % of allyl alcohol monomer units.

31. The process of claim 26 wherein the amount of biphenyl acrylate or methacrylate is about 50 to 90 mole % and the amount of hydroxyethyl acrylate or methacrylate is about 10 to 50 mole %.

32. The process of claim 26 wherein said radiation sensitive resist topcoat comprises a polymer comprising the following monomer units:



wherein R_3 is methyl or hydroxyethyl, R_4 is hydrogen, methyl or $CH_2CO_2CH_3$ and R_5 and R_6 are hydrogen or methyl, with each choice made independently.

33. The process of claim 26 further comprising the step of:

removing said thermally cured undercoat composition to form an image thereof.